

Claims

1. Liposomes, comprised of the said components: Phospholipids, cholesterol, synthetic detergents, as well as drug substances and/or dyes.
2. The liposomes of claim 1, wherein the said phospholipids are comprised of the naturally occurring lung surfactant lipids, dipalmitoylphosphatidylcholine (DPPC), dimyristoylphosphatidylcholine (DMPC), and/or sphingomyelin (SM).
3. The liposomes of claim 1, wherein the said phospholipids are comprised of the naturally occurring lung surfactant lipids, dipalmitoylphosphatidylcholine (DPPC), dimyristoylphosphatidylcholine (DMPC), and/or sphingomyelin (SM) and/or the synthetic detergent, polyethylene glycol.
4. The liposomes of claims 1-3, wherein the molar ratio of the said components dipalmitoylphosphatidylcholine (DPPC), cholesterol (Chol), and polyethylene glycol ranges from 7 : 3 : 0.15 to 7 : 3 : 0.6.
5. The liposomes of claims 1-3, wherein the molar ratio of the said components dipalmitoylphosphatidylcholine (DPPC), cholesterol (Chol), and dimyristoylphosphatidylcholine (DMPC) ranges from 7 : 4 : 1 to 7 : 4 : 4.
6. The liposomes of claims 1-3, wherein the molar ratio of the said components dipalmitoylphosphatidylcholine (DPPC), cholesterol (Chol) is 7 : 3 and the mass percent of sphingomyelin (SM) ranges from 2 to 8%.
7. The liposomes of claims 1-6, wherein hydrophilic, lipophilic, and/or amphiphilic drug substances or dyes are encapsulated within the liposomal structure.
8. The liposomes of claims 1-7, wherein the liposomal structures have a particle size ranging from 0.2 to 1.5 µm in diameter, guaranteeing that the said liposomes are able to be nebulized with air-jet and ultrasonic nebulizers and, further, that the generated aerosol is able to reach as far as the alveolar space for the therapeutic

treatment of the alveoles, the bronchioles, the bronchi and the trachea.

9. The liposomes of claims 1-8, wherein the said liposomal formulations is to be used as therapeutic agents to prevent, diagnose or treat lung diseases and systemic diseases.
10. A method for measuring the release of encapsulated drug substances/dyes from the liposomes, described by the following steps:
 - preparation of the isolated, perfused, ventilated rabbit lung,
 - nebulization of the liposomal formulation with a nebulizer and ventilation system
 - determination of the quantity of dye and/or drug substance in the perfusate and/or homogenate of the rabbit lung.